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PACKAGING PROCESS OF ULTRA-THIN FLIP CHIP ELECTRONIC DEVICE
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PATENT APPLICATION CLAIMS /4075*

1. A type of packaging process of an ultra-thing flip chip electronic device, comprising of:

A crystal connection step, to connect a crystal and a substrate electrically, a crystal cleaning step to reduce the thickness of the crystal by polishing the crystal from one of the surface toward the substrate direction to a predetermined thickness, and a protecting encapsulation step to connect to the substrate by plural molding compounds, so that the crystal and the substrate are encapsulated in a body and are isolated from the exterior.

2. A type of packaging process of an ultra-thing flip chip electronic device as described in Claim 1, of which, multiple electrical connections are formed between a crystal and a substrate and a solidifying non-conducting glue is added to fill the gaps between said crystal and said substrate to prevent electrical interferences between said crystal and said substrate; and, when said non-conducting glue is applied, it disperses the stress on said crystal to substrate connection to even out absorption and prevent damage to said crystal.

3. A type of packaging process of an ultra-thing flip chip electronic device as described in Claim 1, of which said electrical connectors are metal balls, respectively.

4. A type of packaging process of an ultra-thing flip chip electronic device as described in Claim 1, of which said electrical connectors are metal protrusions, respectively.

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* Number in the margin indicates pagination in the foreign text

5. A type of packaging process of an ultra-thing flip chip electronic device as described in Claim 1, of which said crystal cleaning step uses a mechanically polishing method from the direction of the crystal to the substrate to remove a predetermined thickness to reduces the thickness of the crystal. /4076

6. A type of packaging process of an ultra-thing flip chip electronic device as described in Claim 1, of which said crystal cleaning step uses a laser cutting method from the direction of the crystal substrate to the substrate to remove a predetermined thickness to reduces the thickness of the crystal.

7. A type of packaging process of an ultra-thing flip chip electronic device as described in Claim 1, comprising of:

A crystal connection step, to connect a crystal and a substrate electrically, a crystal cleaning step, after said the crystal connection step, to reduce the thickness of the first crystal by polishing the crystal from one of the surface toward the substrate direction to a predetermined thickness, a repeat step where a second crystal is electrically oriented in the opposite direction of the substrate to electrically direct in the direction of said first crystal and are stacked on said substrate to become electrically joined together, from the direction of said second crystal substrate to the substrate, remove a predetermined thickness to reduce the thickness of the crystal, and a protecting encapsulation step to connect to the substrate by plural molding compounds, so that the said stacked crystals and the substrate are encapsulated in a body of the first and second crystals and are isolated from the exterior.

8. A type of packaging process of an ultra-thing flip chip electronic device as described in Claim 7, of which, multiple electrical connections are formed between said first crystal and a substrate and a solidifying non-conducting glue is added to fill the gaps between said first crystal and said substrate to prevent electrical interferences between said first crystal and said substrate; and, when said non-conducting glue is applied, it disperses the stress on said first crystal to substrate connection to even out absorption and prevent damage to said first crystal.

9. A type of packaging process of an ultra-thing flip chip electronic device as described in Claim 8, of which said electrical connectors are metal balls, respectively.

10. A type of packaging process of an ultra-thing flip chip electronic device as described in Claim 8, of which said electrical connectors are metal protrusions, respectively.

11. A type of packaging process of an ultra-thing flip chip electronic device as described in Claim 7, of which, said repeat step is multiple electrical connections are formed between said second crystal and a substrate and a solidifying non-conducting glue is added to fill the gaps between said first crystal and said second crystal, as well as said second crystal and said substrate to prevent electrical interferences between said first crystal and said second crystal, as well as said second crystal and said substrate; and, when said non-conducting glue is applied, it disperses the stress on said second crystal to substrate connection to even out absorption and prevent damage to said second crystal.

12. A type of packaging process of an ultra-thing flip chip electronic device as described in Claim 11, of which said electrical connectors are metal balls, respectively.

13. A type of packaging process of an ultra-thing flip chip electronic device as described in Claim 11, of which said electrical connectors are metal protrusions, respectively.

14. A type of packaging process of an ultra-thing flip chip electronic device as described in Claim 7, of which said crystal cleaning step uses a mechanically polishing method from the direction of the said first crystal to the substrate to remove a predetermined thickness to reduces the thickness of the said first crystal.

15. A type of packaging process of an ultra-thing flip chip electronic device as described in Claim 7, of which said crystal cleaning /4077 step uses a laser cutting method from the direction of the said first crystal to the substrate to remove a predetermined thickness to reduces the thickness of the said first crystal.

16. A type of packaging process of an ultra-thing flip chip electronic device as described in Claim 7, of which said repeat step can connect said substrate to the second crystal, electronically and use a mechanically polishing method from the direction of the crystal to the substrate to remove a predetermined thickness to reduces the thickness of said second crystal.

17. A type of packaging process of an ultra-thing flip chip electronic device as described in Claim 7, of which said repeat step can connect said substrate to the second crystal, electronically and use a laser

cutting method from the direction of the crystal to the substrate to remove a predetermined thickness to reduces the thickness of said second crystal.

DESCRIPTION OF THE DIAGRAMS

Figure 1 is a diagram of a packaging process of a flip chip electronic device.

Figure 2 is a cross section diagram of the packaged electronic device of the packaging process of a flip chip electronic device from Fig. 1.

Figure 3 is a process diagram of the first preferred embodiment of the packaging process of an ultra-thing flip chip electronic device for the present invention.

Figure 4 is a cross section diagram of the packaged electronic device of the packaging process of a flip chip electronic device from Fig. 3.

Figure 5 is a process diagram of the second preferred embodiment of the packaging process of an ultra-thing flip chip electronic device for the present invention.

Figure 6 is a cross section diagram of the packaged electronic device of the packaging process of a flip chip electronic device from Figure 5.

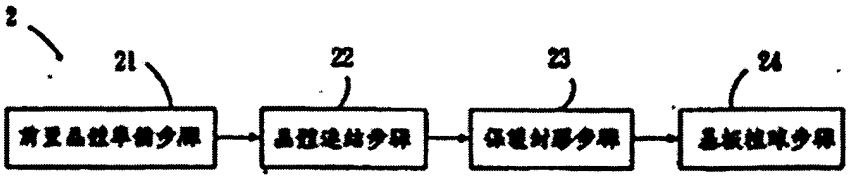

Figure 1

Figure 1 Key:
21. Preprocess crystal step
22. Crystal connection step
23. Encapsulation step
24. Substrate balling step

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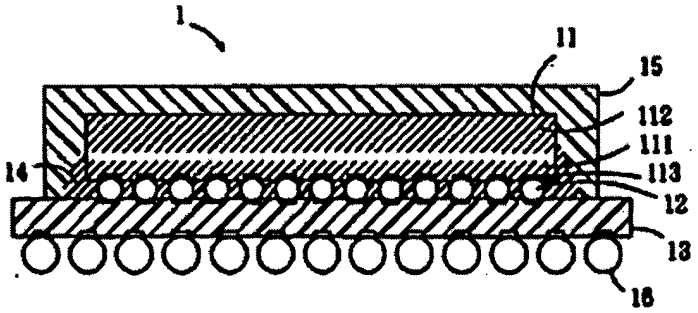

Figure 2

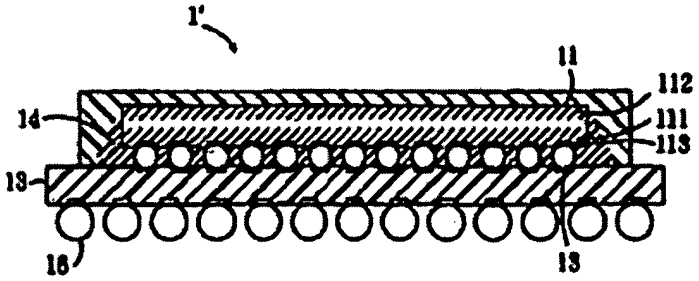

Figure 4

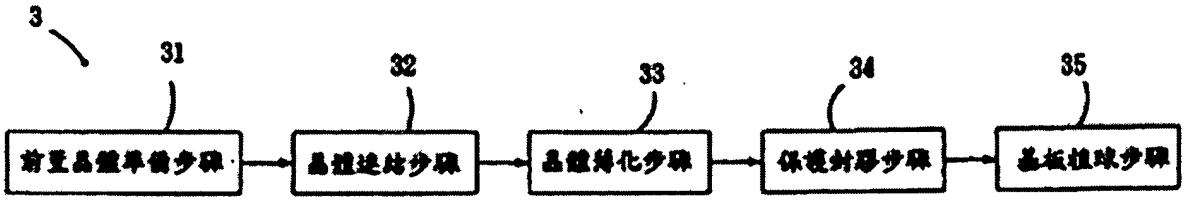

Figure 3

Figure 3 Key:
31. Preprocess crystal step
32. Crystal connection step
33. Crystal cleaning step
34. Encapsulation step
35. Substrate balling step

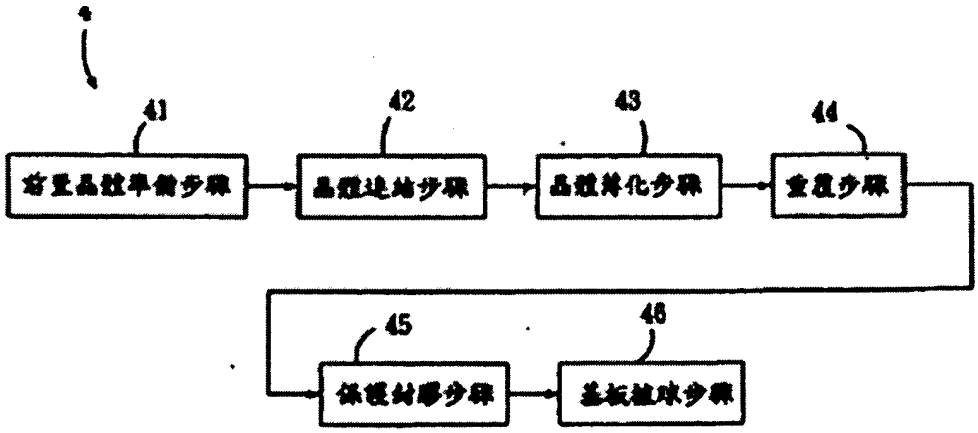

Figure 4

Figure 4 Key:
41. Preprocess crystal step
42. Crystal connection step
43. Crystal cleaning step
44. Repeat step
45. Encapsulation step
46. Substrate balling step

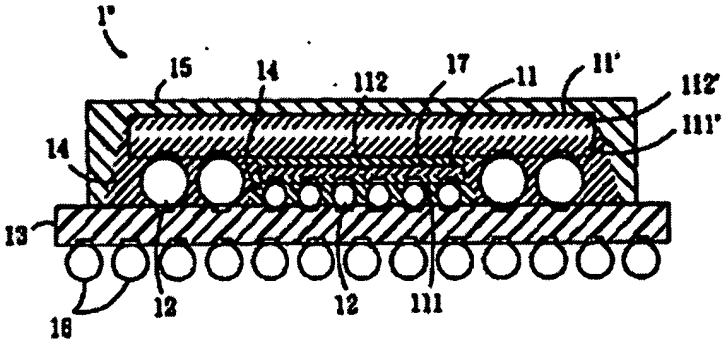

Figure 5